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EXAMINER	
BROOKS, JERRY L.	

ART UNIT	PAPER NUMBER
4126	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,877	SALTERS ET AL.	
	Examiner	Art Unit	
	JERRY BROOKS	4126	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-26* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro."

3. With respect to claim 1, Shiro discloses a display device (fig.1) for generating a three-dimensional volumetric image, comprising: a two-dimensional image display panel ((c) 2-D display) for generating a two- dimensional image; a first focusing element ((c) LC varifocal lens) for projecting the two-dimensional image to a virtual image in an imaging volume; and means for (fig.2 (a)) altering the effective optical path length between the display panel ((c) 2-D display) and the projecting first focusing element ((c) LC varifocal lens) so as to alter the position of the virtual image within the imaging volume (fig.5), wherein the means for altering the effective optical path length includes an optical path length adjuster (see fig. 3) for varying an effective optical path length between an input optical path (incident path fig.3) and an output optical path (refracted path fig.3), comprising: a first polarisation switch (see fig. 3 (a)) for selecting a polarisation state for an input beam (see fig.3 (a)) on the input optical path(see fig.3 (a));

and an optical element (liquid crystal molecules in fig. 3) having birefringent properties and; thereby defining at least two possible effective optical paths of different lengths (see fig.3, (a) and (b)). therethrough, for passing the input beam (see fig.3, incident light) along a selected one of said at least two possible optical paths according to the selected polarisation state (see fig. 3, high and low frequency) of the input beam and for providing an output beam of light (see fig.3, refracted light), on said optical output path, that has traveled along the selected optical path.

4. With respect to claim 2, Shiro discloses the apparatus of claim 1 in which the birefringent optical element has its optic axis orthogonal to the optical axis defined by the input path and the output path (see fig.3 (a)).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-5, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as “Shiro” in view of Zehetner (US 6,799,879) herein after referred to as “Zehetner.”

7. With respect to claim 3, Shiro discloses the apparatus of claim 1, but does not disclose further including an optical element for at least partially correcting for astigmatism.

8. Zehetner discloses an imaging system (see FIG., "reference does not show Fig #") that contains an optical element (5). Zehetner further discloses that the optical element is used to correct astigmatism (see col. 3, lines 22-33). At the time of invention it would have been obvious to one ordinary skill in the art to use Zehetner's optical element in Shiro's device to improve the quality of the image by at least partially correcting astigmatism (see col.3, lines 22-33). Therefore it would have been motivated to combine Zehetner and Shiro.

9. With respect to claim 4, Shiro in view of Zehetner discloses the apparatus of claim 3; Shiro does not explicitly disclose the birefringent optical element including a cylindrically-shaped optical surface for correcting for astigmatism.

10. Zehetner discloses using a cylindrically-shaped optical surface to correct astigmatism (see col.3, lines 22-33). At the time of invention it would have been obvious to one ordinary skill in the art to combine Zehetner's cylindrically-shaped optical surface with Shiro's birefringent optical element to improve the quality of the image by at least partially correct astigmatism (see col.3, lines 22-33). Therefore it would have been motivated to combine Zehetner and Shiro.

11. With respect claim 5, Shiro discloses the apparatus of claim 1, but does not disclose in which the birefringent optical element further includes a fitting, non-birefringent counterpart element attached to the cylindrical-shaped optical surface.

12. However Shiro in view of Zehetner discloses the apparatus of claim 4, in which the birefringent optical element further includes a fitting, non-birefringent counterpart element attached to the cylindrical-shaped optical surface (see FIG., 5 and col. 3, lines 50-60). At the time of invention it would have been obvious to one ordinary skill in the art to combine Zehetner's cylindrically-shaped optical surface with Shiro's birefringent optical element for the reasons discussed above.

13. With respect to claim 17, Shiro in view of Zehetner discloses the display device of claim 3, but does not disclose the display device of claim 3 in which the display panel is positioned at a distance from the birefringent optical element such that astigmatic aberration is substantially minimised or eliminated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the display panel at a distance from the birefringent optical element such that astigmatic aberration is substantially minimised or eliminated, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. In re Aller, 105 USPQ 233.

14. With respect to claim 18, Shiro in view of Zehetner discloses the display device of claim 3, but does not disclose the display device of claim 3 in which the display panel is positioned at a distance from the birefringent optical element such that spherical aberration is substantially minimised or eliminated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the display panel at a distance from the birefringent optical element such that spherical aberration is substantially minimised or eliminated, since it has been held that where the general

condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. In re Aller, 105 USPQ 233.

15. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Zehetner (US 6,799,879) herein after referred to as "Zehetner" as evidenced by Biles (5,013,107) herein after referred to as "Biles."

16. With respect to claim 6, Shiro in view of Zehetner discloses the apparatus of claim 5, but does not explicitly disclose the counterpart element having a refraction index substantially equal to the ordinary index of refraction of the birefringent element. However it was well know in the art as evidenced by Biles (col.3, lines 35-40) to have optical elements with equal index of refraction in order to prevent internal reflection. Therefore it would have been obvious at the time of invention to one of ordinary skill in the art to include a counterpart element having a refraction index substantially equal to the ordinary index of refraction of the birefringent element in order to reduce internal reflection and thereby improve the efficiency of the device (col.3, lines 35-40).

17. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal

Lens herein after referred to as “Shiro” in view of Zehetner (US 6,799,879) herein after referred to as “Zehetner” and further in view of Yoshifumi Nishimoto (GB 2171535) herein after referred to as “Yoshi.”

18. With respect to claim 7, Shiro in view of Zehetner discloses the apparatus of claim 3, but does not explicitly disclose in which the birefringent optical element comprises a spherical lens (201). Yoshi discloses a birefringent optical element (fig. 3, 3) which comprises a spherical lens. At the time of invention it would have been obvious to one of ordinary skill in the art to use Yoshi's spherical lens to reduce material cost. Therefore it would have been motivated to combine Yoshi's disclosure with Shiro in view of Zehetner.

19. With respect to claim 8, Shiro in view of Zehetner discloses the apparatus of claim 3, but does not explicitly disclose in which the birefringent optical element comprises a spherical lens (201).

20. However Shiro in view of Zehetner and further in view of Yoshi discloses the apparatus of claim 7 in which the spherical lens is a plano-convex lens (fig. 3, 3). At the time of invention it would have been obvious to one of ordinary skill in the art to use Yoshi's spherical lens with Shiro in view Zehetner for the reason disclosed above.

21. Claims 9 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal

Lens herein after referred to as "Shiro" in view of Hirata (US 2002/0196556 A1) herein after referred to as "Hirata."

22. With respect to claim 9, Shiro discloses the apparatus of claim 1, but does not disclose further including an optical element for at least partially correcting for spherical aberration. Hirata discloses an optical element (paragraph 0020). Hirata further discloses that the optical element corrects spherical aberration (paragraph 0020). At the time of invention it would have been obvious to one ordinary skill in the art to use Hirata's optical element in Shiro's device to improve the quality of the image by at least partially correcting aberration (see paragraph 0200). Therefore it would have been motivated to combine Hirata and Shiro.

23. With respect to claim 19, Shiro in view of Hirata disclose the display device of claim 9, but does not explicitly disclose the display device of claim 9 in which the display panel, the birefringent optical element and the spherical aberration correction element are relatively positioned such that spherical aberration is substantially minimised or eliminated. It would have been obvious to one having ordinary skill in the art at the time the invention was made to relatively position the display panel, the birefringent optical element and the spherical aberration correction element such that spherical aberration is substantially minimised or eliminated, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. In re Aller, 105 USPQ 233.

24. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Hirata (US 2002/0196556 A1) herein after referred to as "Hirata" and in further view of Rogers (4,525,413) herein after referred to as "Rogers."

25. With respect to claim 10, Shiro in view of Hirata discloses, the apparatus of claim 9 in which the spherical aberration correction element is a spherical lens, but does not disclose the birefringent optical element is a cylindrically corrected plane-parallel plate. Rogers discloses a cylindrically corrected plane-parallel plate (fig.5 and col. 26,–lines 35-50). At the time of invention it would have been obvious to one ordinary skill in the art to use Rogers's cylindrically corrected plane-parallel plate in Shiro's device in view of Hirata to reduce material cost. Therefore it would have been motivated to combine Roger's teaching to Shiro in view of Hirata.

26. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Baba (US 4,647,159) herein after referred to as "Baba."

27. With respect to claim 9, Shiro discloses the apparatus of claim 1, but does not disclose further including an optical element for at least partially correcting for spherical aberration. Buba discloses an optical element ((fig.4, 2) and col.6, lines 39 - 43). Hirata further discloses that the optical element corrects spherical aberration (col.6, lines 39 - 43). At the time of invention it would have been obvious to one ordinary skill in the art to use Buba's optical element in Shiro's device to improve the quality of the image by at least partially correcting spherical aberration (col.6, lines 39 - 43). Therefore it would have been motivated to combine Baba and Shiro.

28. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Baba (US 4,647,159) herein after referred to as "Baba" and further in view of Yoshifumi Nishimoto (GB 2171535) herein after referred to as "Yoshi."

29. With respect to claim 11, Shiro in view of Buba disclose claim 9, in which the spherical aberration correction element is a plane-parallel plate ((fig.4, 2) and col.6, lines 39 - 43), but does not disclose in which the birefringent optical element is a spherical lens. Yoshi discloses a birefringent optical element (fig. 3, 3) which comprises a spherical lens. At the time of invention it would have been obvious to one of ordinary

skill in the art to use Yoshi's spherical lens to reduce material cost. Therefore it would have been motivated to combine Yoshi's disclosure with Shiro in view Buba.

30. Claims 12-14, 20 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as “Shiro” in view of Yoshifumi Nishimoto (GB 2171535) herein after referred to as “Yoshi.”

31. With respect to claim 12, Shiro discloses the apparatus of preceding claim 1 but does not disclose claim 1 with at least one further optical path length adjuster of any preceding claim in a cascade formation, such that the output optical path of the first said optical path length adjuster forms the input path of a successive said further optical path length adjuster.

32. Yoshi discloses at least one further optical path length adjuster (fig.5, 2n and 6) in a cascade formation, such that the output optical path of the first said optical path length adjuster (see fig. 5, 2n) forms the input path of a successive said further optical path length adjuster (see fig. 5, 6). At the time of invention it would have been obvious to one of ordinary skill in the art to improve Shiro’s device by using Yoshi's optical path adjuster arrangement to continuously change the focal length (page 3, lines 1-5). Therefore it would have been motivated to combine Yoshi's teaching with Shiro.

33. With respect to claim 13, Shiro discloses the apparatus of claim 12, but does not disclose in which the optical paths of each said optical path length adjuster include

different optical path lengths such that a plurality of possible overall optical path lengths are selectable by appropriate selection of path length within each said optical path length adjuster.

34. However, Yoshi discloses optical paths of each said optical path length adjuster (see fig. 5) include different optical path lengths (see f1, f2, fN) such that a plurality of possible overall optical path lengths are selectable by appropriate selection of path length within each said optical path length adjuster (see page 2 (line 110) to page 3 (line 6)). At the time of invention it would have been obvious to one of ordinary skill in the art to improve Shiro's device by using Yoshi's optical path adjuster arrangement for the reason discussed above.

35. With respect to claim 14, Shiro discloses the device of claim 1, but does not disclose in which each successive optical path length adjuster in the cascade has a thickness of birefringent optical element which is different from any other birefringent optical element in the cascade.

36. However Shiro in view of Yoshi discloses the apparatus of claim 13, in which each successive optical path length adjuster in the cascade has a thickness of birefringent optical element which is different from any other birefringent optical element in the cascade (page 2, lines 110 - 115; figure 5). At the time of invention it would have been obvious to one of ordinary skill in the art to improve Shiro's device by using Yoshi's optical path adjuster arrangement for the reason discussed above.

37.

38. With respect to claim 20, Shiro discloses a method for generating a three-dimensional volumetric image (fig.1), comprising the steps of: generating a two-dimensional image on a two-dimensional image display panel ((c) 2-D display); projecting the two-dimensional image to a virtual image in an imaging volume with a first focusing element ((c) LC varifocal lens); and altering the optical path length between the display panel (fig.2 (a), also see fig. 3) and the projecting focusing element so as to vary the position of the virtual image within the imaging volume (fig.5) by varying an effective optical path length between an input optical path and an output optical path of an optical path length adjuster (see fig.3, (a) and (b)), comprising the steps of: selecting a polarisation state (see fig.3, (a) and (b)) for an input beam of light on the input optical path using a first polarisation switch(see fig. 3, high and low frequency); passing the input beam into an optical element having birefringent properties (see fig.3, (a) and (b)) and thereby defining at least two possible effective optical paths of different lengths therethrough (see fig.3, (a) and (b)), the input beam traveling along a selected one of said at least two possible effective optical paths according to the selected polarisation state of the input beam (see fig.3, (a) and (b)); and providing an output beam of light, from the birefringent optical element on said optical output path (see fig.3, (a) and (b): dual frequency molecules) .

39. But Shiro does not disclose an optical path adjust positioned between the display panel and the projecting focusing element. Yoshi discloses placing an optical path adjust after the projecting focusing element (see fig. 2, 6). It would have been obvious at the time of invention to apply Yoshi's disclosure to Shiro's device so that the optical path

adjust is positioned between the display panel ((c) 2-D display) and the focusing element (fig.2 (a), also see fig. 3) to improve the continuity of the change in focal points (page 3, lines 1-5). Therefore it would have been motivated to combine Yoshi and Shiro.

40. With respect to claim 23, Shiro does not disclose the method of claim 20. However Shiro in view of Yoshi discloses the method of claim 20 further including the step of passing the beam through at least one further optical path length adjuster (fig.5, 2n) such that the output optical path of the first said optical path length adjuster forms the input path of a successive said further optical path length adjuster (see fig. 5), and selecting optical path length using each optical path length adjuster (see page 2 (line 110) to page 3 (line 6)). It would have been obvious at the time of invention to apply Yoshi's disclosure to Shiro's device for the reason discussed above.

41. With respect to claim 24, Shiro in view of Yoshi discloses the method of claim 20, but do not disclose the method of claim 20 further including the step of positioning the optical path length adjuster at a distance from an object to be imaged so as to minimise astigmatic aberration. It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the optical path length adjuster at a distance from an object to be imaged so as to minimise astigmatic aberration, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. In re Aller, 105 USPQ 233.

42. With respect to claim 25, Shiro in view of Yoshi discloses the method of claim 20, but do not disclose the method of claim 20 further including the step of positioning the

optical path length adjuster at a distance from an object to be imaged so as to minimise spherical aberration. It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the optical path length adjuster at a distance from an object to be imaged so as to minimise spherical aberration, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. In re Aller, 105 USPQ 233.

43. With respect to claim 26, Shiro does not disclose the method of claim 23. However Shiro in view of Yoshi discloses the method of claim 23, further including the step of selecting (see fig. 5, f1-fN) different optical path lengths within each said optical path length adjuster (see page 2 (line 110) to page 3 (line 6)). It would have been obvious at the time of invention to apply Yoshi's disclosure to Shiro's device for the reason discussed above.

44. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Yamamoto Tsuyoshi (0 435 296 A1) herein after referred to as "Yamamoto".

45. With respect to claim 15, Shiro discloses the apparatus of 1 but does not disclose including a further optical path length adjuster comprising: a first polarisation switch for selecting a polarisation state for an input beam on an input optical path; and

46. first and second beam splitters having at least two possible optical paths of different lengths therebetween, for passing the input beam along a selected one of said at least two possible optical paths according to the selected polarisation state of the input beam and for providing an output beam of light, on an optical output path, that has traveled along the selected optical path.

47. Yamamoto discloses an optical path length adjuster (Fig. 7A) comprising: a first polarisation switch (12) for selecting a polarisation state for an input beam on an input optical path; and first (10) and second (11) beam splitters having at least two possible optical paths (see Fig.7A and Fig.7B) of different lengths therebetween, for passing the input beam along a selected one of said at least two possible optical paths according to the selected polarisation state of the input beam (see column 1, line 46 – column 14, line 56) and for providing an output beam of light, on an optical output path (see Fig.7 A and B, “out”), that has traveled along the selected optical path (see Fig.7A and Fig.7B). At the time of invention it would have been obvious to one of ordinary skill in the art to improve Shiro’s device by using Yamamoto's optical path adjuster arrangement to reduce material cost (col. 2, lines 40-50 and col. 3, lines 1-5). Therefore it would have been motivated to combine Yamamoto’s teaching with Shiro.

48. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Yoshifumi Nishimoto (GB 2171535) herein after referred to as "Yoshi" and further in view of Zehetner (US 6,799,879) herein after referred to as "Zehetner."

49. Shiro in view of Yoshi disclose the method of claim 20, but not further including the step of at least partially correcting for astigmatism. Zehetner disclose a step of at least partially correct for astigmatism (see col.3, lines 22-33). At the time of invention it would have been obvious to one ordinary skill in the art to use Zehetner's optical element in Shiro's device to improve the quality of the image by at least partially correcting astigmatism (see col.3, lines 22-33). Therefore it would have been motivated to combine Zehetner and Shiro in view of Yoshi.

50. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiro Suyama et al. in the Japanese Journal of Applied Physics, Vol. 39 (2000) pp. 480-484, Three-Dimensional Display System with Dual-Frequency Liquid-Crystal Varifocal Lens herein after referred to as "Shiro" in view of Yoshifumi Nishimoto (GB 2171535) herein after referred to as "Yoshi" and further in view of Hirata (US 2002/0196556 A1) herein after referred to as "Hirata."

51. Shiro in view of Yoshi disclose the method of claim 20, but not further including the step of at least partially correcting for spherical aberration. Hirata disclose a step of

at least partially correct for astigmatism (paragraph 0020). At the time of invention it would have been obvious to one ordinary skill in the art to use Hirata's method in Shiro's device to improve the quality of the image by at least partially correcting aberration (see paragraph 0200). Therefore it would have been motivated to combine Hirata and Shiro in view of Yoshi.

Allowable Subject Matter

52. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

53. With respect to claim 16, The prior art of record, taken alone or in combination, fail to disclose or render obvious the apparatus comprising:

54. the second beam splitter (106) has first and second optical inputs (106a, 106b) respectively optically coupled to the first and second outputs (105b, i05c) of the first beam splitter (105), via respective said first and second optical paths (ii0, iii), the second beam splitter (106) diverting light at the first and second;

55. inputs (106a, 106b) to first and second outputs (I06c, 106d) of the second beam splitter (106) according to a polarisation state of light at the first and second inputs thereof;

56. the first output (i06c) of the second beam splitter (106) defines the optical output path (54), and the second output (106d) of the second beam splitter is optically coupled to a second input (105d) of the first beam splitter (105) via a third optical path (112) ;

57. each of the first, second and third optical paths (II0, iii, 112) respectively includes one of a second, a third and a fourth polarisation switch (104, 102, 103),

58. the first, second, third and fourth polarisation switches adapted to thereby select cumulative combinations of one or more of said first, second and third optical paths between the input optical path (52) and the output optical path (54), Which structurally arranged and functionally operated as claimed in claim 16.

59. ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BROOKS whose telephone number is (571)270-5711. The examiner can normally be reached on Monday-Thursday: 10 a.m.-5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Nguyen can be reached on (571)272-2424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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